

RAPHANUS BOISSIERI (CRUCIFERAE), A NEW SPECIES FROM THE MIDDLE EAST

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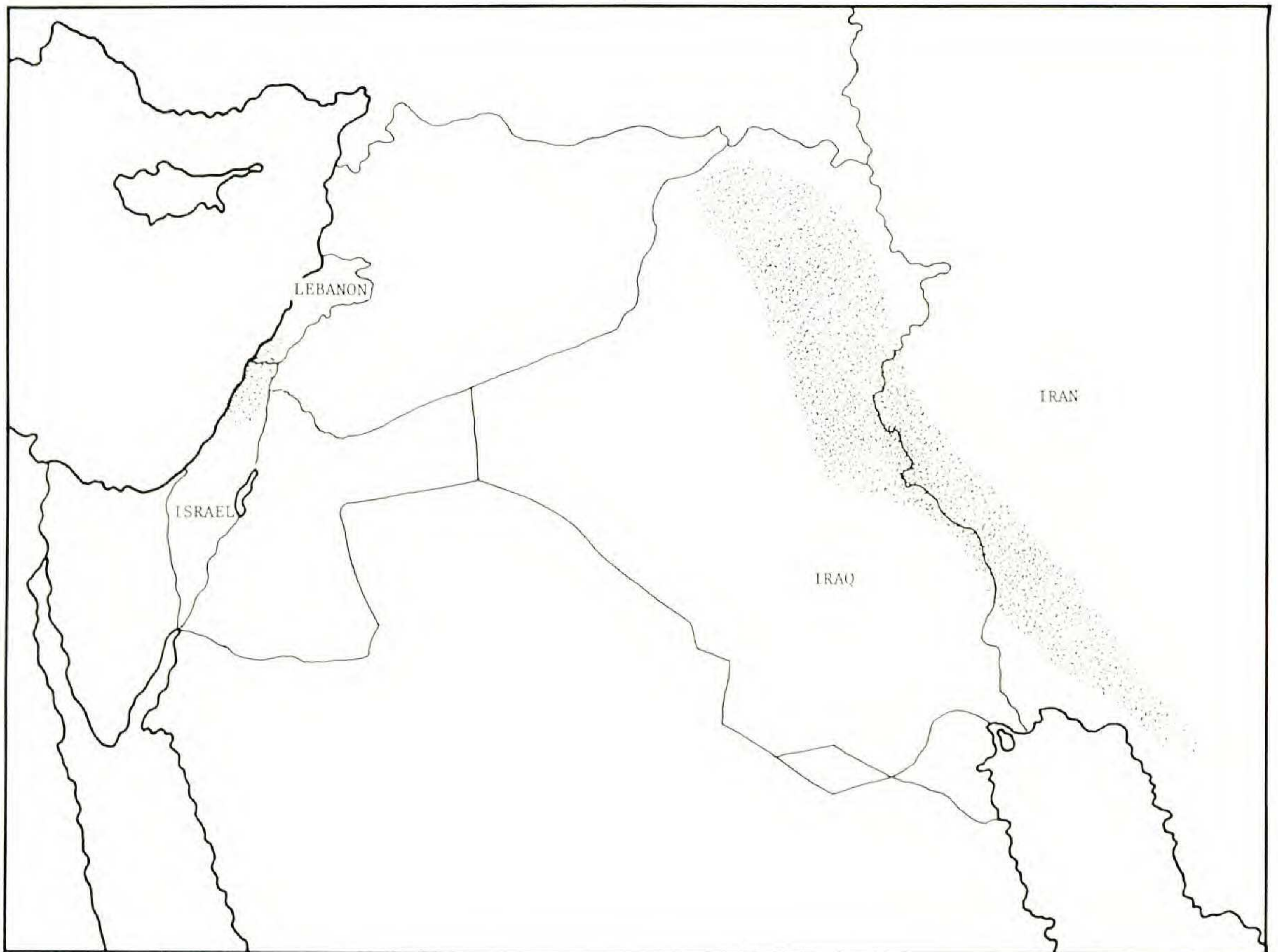
IN 1842 Edmond Boissier described *Brassica aucheri* from a specimen collected by Aucher-Éloy near Mosul in Mesopotamia (Iraq). He later (1849) transferred the species to *Raphanus* L. (*R. aucheri* (Boiss.) Boiss.) and cited two additional collections from western Persia (Iran) and Galilee (northern Israel). Finally, in 1867 he placed the species in the monotypic section *Hesperidopsis* Boiss. and cited new collections from what is now southern Lebanon. However, Boissier did not realize that he was dealing with two very distinct species, one from Iraq and Iran and another from the eastern Mediterranean area (Lebanon and Israel) (see MAP 1).

Schulz (1919) was the first to recognize two species in this complex by retaining the eastern Mediterranean plant as *Raphanus aucheri* and transferring the Iraqi-Iranian species to *Sinapis* L. (*S. aucheri* (Boiss.) O. E. Schulz). However, he did not realize that both names were based on the same type, collected by Aucher-Éloy. Many subsequent authors, particularly Hedge and Lamond (1980), Hedge and Rechinger (1968), Mouterde (1970), and Zohary (1966), have followed Boissier by considering the plants of both areas as conspecific, while Zohary and colleagues (1980) accepted two species following Schulz. Greuter and Burdet (1983) have raised sect. *Hesperidopsis* sensu Schulz to a genus (*Quidproquo* Greuter & Burdet) without presenting supporting evidence for its distinctness from *Raphanus*. In my opinion, the eastern Mediterranean plant is appropriately assigned to *Raphanus*. However, it is described below as a new species, *R. boissieri*, because the name *R. aucheri* (Boiss.) Boiss. that has been applied to this species is based on *Brassica aucheri*, the type specimen of which (Aucher-Éloy 203) is the nomenclatural type of *Sinapis aucheri*. *Quidproquo confusum* Greuter & Burdet cannot be used because a type specimen was not designated.

***Raphanus boissieri* Al-Shehbaz, sp. nov.**

Raphanus aucheri (Boiss.) Boiss. Diagn. Pl. Orient. Nov. 2(8): 45. 1849, in part.
Quidproquo confusum Greuter & Burdet, Willdenowia 13: 94. 1983.

Herba annua erecta, 2–6(–8) dm alta, retrorse hispida. Folia basalia petiolata, subrosulata, lyrata vel pinnatisecta, (5.5–)8–11(–20) cm longa, 2–7 cm lata. Racemi ebracteati; pedicelli floriferi recti, ascendentes, fructiferi valde curvati, 5–10(–13) mm longi. Sepala erecta vel patentia, (3–)5–8(–11) mm longa. Petala obovata, unguiculata, flava, (8–)10–15(–20) mm longa; unguicula 4–8(–12) mm



MAP 1. Distributions of *Raphanus boissieri* (left; Israel-Lebanon) and *Sinapis aucheri* (right; Iraq-Iran).

longa. Siliqua indehiscens, suberosa, cylindrica, pendula, retrorse hispida, 5–10 cm longa, 2–4.5 mm lata; segmenta inferiora asperma, obsoleta; rostrum subtorulosum, lomentaceum, 8–12 spermum. Semina oblonga, humiditate nonmucilaginoso, 2–2.5 mm longa.

Annual erect herb, retrorsely hispid throughout, rarely glabrescent above, 2–6(–8) dm high. Basal leaves nearly rosulate, petiolate, lyrate to pinnatisect, oblong to oblanceolate, (5.5–)8–11(–20) by 2–7 cm; terminal lobe broadly obovate or ovate, dentate to crenate, larger than lateral lobes. Upper cauline leaves sessile or short petiolate, oblong to linear or lanceolate, rarely lyrate, entire or dentate. Inflorescence an ebracteate corymbose raceme, greatly elongating in fruit; flowering pedicels ascending, straight; fruiting pedicels strongly curved and usually forming loop, 5–10(–13) mm long. Sepals erect or sometimes spreading, saccate, oblong to nearly linear, obtuse, (3–)5–8(–11) mm long, glabrous or setulose; petals obovate, clawed, (8–)10–15(–20) mm long, claw 4–8(–12) mm long, yellow or rarely whitish, without or rarely with dark veins; lateral nectar glands usually flat, median ones ovoid or cylindrical; stamens tetradynamous, anthers oblong. Siliques pendulous, indehiscent, lomentaceous, subtorulose, cylindrical, straight or slightly curved, 5–10 cm by 2–4.5 mm, corky, retrorsely hispid or scabrous, smooth or slightly striate; lower segment seedless, abortive or obsolete; beak 8- to 12-seeded; style 1–2 mm long, stigma



FIGURE 1. Mature fruits of *Raphanus boissieri* (left) and *Sinapis aucheri* (right).

capitate. Seeds oblong, 2–2.5 mm long, brown, nonmucilaginous when wet; cotyledons conduplicate.

TYPE. Palestine [Israel], Galilee, April–May 1846, *E. Boissier s.n.* (holotype, GH!; isotypes, G-BOIS!).

SPECIMENS EXAMINED. **Israel:** Hunin, Galilee, *Bornmüller 114* (G-BOIS); Baniyas, *Boissier s.n.*, April–May 1846 (G-BOIS); Mt. Tabur, *Boissier s.n.*, May 1846 (G-BOIS). **Lebanon:** Saida, *Blanche s.n.* (G-BOIS); between Rachaya and Hasbaya, *Gaillardot s.n.* (G-BOIS).

Raphanus boissieri is endemic to southern Lebanon and northern Israel. Zohary and colleagues (1980) and Mouterde (1970) have listed it as *R. aucheri* from southern Sinai (Egypt) and Iskenderun (Turkey), respectively.

Raphanus boissieri resembles *Sinapis aucheri* in the curvature of the fruiting pedicels, the orientation and the corky texture of the fruits, and the retrorse pubescence of the fruits and stems. It is very difficult to distinguish between the two from specimens lacking fruits, and this may have been the main factor behind Boissier's failure to treat the eastern Mediterranean and the Iraqi-Iranian plants as distinct species. To my knowledge, only one specimen of *S. aucheri* with mature fruits is present in Boissier's herbarium, and this was described by Boissier (1888) as *Enarthrocarpus tragicerus* Boiss. & Hausskn. *Raphanus boissieri* is easily distinguished from *S. aucheri* by its oblong seeds and its fruits with a smooth, straight upper segment and a seedless, indehiscent, abortive or obsolete lower segment. In *S. aucheri* the seeds are globose, and

the fruits usually have a falcately curved upper segment with coarse tubercles or thickenings opposite the seeds and a dehiscent, several-seeded, well-developed lower segment (see FIGURE 1).

Sinapis aucheri is anomalous in this genus because of its several-seeded, torulose, corky beaks and its haploid chromosome number of seven (Al-Shehbaz & Al-Omar, 1982; Aryavand, 1975). The other species of *Sinapis* have 1- or 2-seeded, nontorulose, noncorky beaks and a chromosome number of $n = 9$ or 12 (Gómez-Campo & Hinata, 1980).

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